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09/417,268 10/13/99 CHENCHIK

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EXAMINER

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BRET FIELD  
BOZICEVIC FIELD & FRANCIS LLP  
285 HAMILTON AVENUE STE 200  
PALO ALTO CA 94301

FORMAN, B

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/417,268

Applicant(s)

CHENCHIK, ALEX

Examiner

BJ Forman

Art Unit

1655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17, 38, 43, 46, 53 and 57-59 is/are pending in the application.
- 4a) Of the above claim(s) 38, 43 and 46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 53 and 57-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. Applicant's election of Group I, Claims 1-17 & 53, in Paper No. 7 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 38, 43 & 46 are withdrawn from prosecution. New claims 57-59 have been added. Claims 1-17, 53 & 57-59 are under prosecution.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-17, 53 & 57-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 1-17, 53 & 59 are indefinite in the recitation "each probe oligonucleotide spot corresponds to a target nucleic acid" because "corresponds" is a non-specific relational term and as such the relationship between the "probe oligonucleotide spot and "target nucleic acid" is not defined. It is suggested that Claim 1 be amended to define the relationship e.g. replace "corresponds" with "hybridizes" or "complementary".

b. Claims 2-4 are indefinite in Claim 2, lines 1-2 for the recitation "unique oligonucleotides are capable of hybridizing to different regions of the corresponding target nucleic acid" because it is unclear whether "capable of hybridizing" is a characteristic of the oligonucleotides or a method step. It is suggested that Claim 2 be amended to replace "capable of hybridizing" with "hybridizes to" or "is complementary to". The above recitation in Claim 2 is further indefinite because "corresponding" is a non-specific relational term and therefore the

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relationship between the “different regions” and the “target nucleic acid” is undefined. It is suggested that the claims be amended to define the relationship or to delete “corresponding”.

c. Claim 10 is indefinite in the recitation “the length” because “length” lacks proper antecedent basis in Claim 1. It is suggested that the claim be amended to delete “the length of” and to recite at the end of the claim “.....15 to 150 nucleotides in length”.

d. Claim 12 is indefinite in the recitation “the number of oligonucleotides” because “number” lacks proper antecedent basis in Claim 1. It is suggested that the claim be amended to delete “the number of oligonucleotides of” and to recite at the end of the claim “.....ranges from about 3 to 50 in number.”

e. Claims 14 & 15 are indefinite for the recitation “the density” because “density” lacks proper antecedent basis in the claim. It is suggested that Claim be amended to recite “wherein the spots on said array do not exceed a density of about 400/cm<sup>2</sup>.”

f. Claims 16 & 17 are indefinite in the recitation “the number of” because “number” lacks proper antecedent basis in Claim 1. It is suggested that Claim 16 be amended to recite “wherein the spots on said array range from about 50 to 10,000 in number.

g. Claims 57 & 58 are indefinite in the recitation “probe oligonucleotide spots stably associated with the surface of a solid support” because “stably” is a relative term that requires definition e.g. covalently attached or criteria for determining and because “associated with” is a non-specific relational phrase and therefore the relationship between the “probe oligonucleotide spots” and “the surface of the solid support” is not defined. The recitation is further indefinite because “the surface” lacks proper antecedent basis in the claim preamble. It is suggested that the claims be amended to define or to recite criteria for determining “stably”, to define the relationship between the “probe oligonucleotide spots” and “the surface of the solid support” and to replace “the surface” with “a surface” e.g. “probe oligonucleotide spots attached to a surface of a solid support”.

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h. Claims 57 & 58 are indefinite in the recitation "each probe oligonucleotide spot corresponds to a target nucleic acid" because "corresponds" is a non-specific relational term and as such the relationship between the "probe oligonucleotide spot and "target nucleic acid" is not defined. It is suggested that Claim 1 be amended to define the relationship e.g. replace "corresponds" with "hybridizes".

i. Claims 57 & 58 are indefinite in the recitation "unique oligonucleotides are capable of hybridizing to different regions of the corresponding target nucleic acid" because it is unclear whether "capable of hybridizing" is a characteristic of the oligonucleotides or the target nucleic acid. It is suggested that the claims be amended to replace "capable of hybridizing" with "hybridizes to". The above recitation in is further indefinite because "corresponding" is a non-specific relational term and therefore the relationship between the "different regions" and the "target nucleic acid" is undefined. It is suggested that the claims be amended to define the relationship or to delete "corresponding".

j. Claims 57 & 58 are indefinite in the last line for the recitation "of the probe oligonucleotide spot in which it is positioned." because the syntax is confusing and because it is unclear what pronoun "it" refers. It is suggested that the claims be amended to clarify.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 5-10, 12-17, 57 & 58 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Brown et al. (U.S. Patent No. 5,807,522, filed 7 June 1995).

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Regarding Claim 1, Brown et al. disclose an array which is a multi-cell substrate, comprising at least one pattern of probe oligonucleotide spots which are microarrays, wherein the spots (microarrays) are attached to the surface of a solid support (Column 3, lines 23-26), wherein each probe oligonucleotide spot (microarray) comprises an oligonucleotide probe composition made up of a plurality of unique oligonucleotides (Column 4, lines 16-19) for a target nucleic acid (Column 15, lines 22-27).

Regarding Claim 2, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein said plurality of unique oligonucleotides hybridize to different regions of the target nucleic acid wherein the different regions represent all known mutations in a disease gene (Column 15, lines 19-27).

Regarding Claim 5, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein two or more different target nucleic acids are represented in said pattern (Column 4, lines 52-55).

Regarding Claim 6, Brown et al. disclose the array (multi-cell substrate) wherein each oligonucleotide spot (microarray) corresponds to a different target nucleic acid i.e. different target yeast nucleic acids are arrayed in different spots (microarrays) of the array (Example 3, Column 18, lines 39-43).

Regarding Claim 7, Brown et al. disclose the array (multi-cell substrate) of Claim 5 wherein two or more oligonucleotide spots (microarray) correspond to the same target nucleic acid (Column 13, lines 1-10).

Regarding Claim 8, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein said array comprises a plurality of said patterns of oligonucleotide spots (microarray) (Column 11, lines 51-58).

Regarding Claim 9, Brown et al. disclose the array (multi-cell substrate) of Claim 8 wherein said plurality of patterns are separated from each other by walls which are grids (Column 4, lines 45-51).

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Regarding Claim 10, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein each of said oligonucleotides range from 15 to 150 nucleotides in length (Column 13, lines 21-22).

Regarding Claim 12, Brown et al. teach the array (multi-cell substrate) of Claim 1 wherein the oligonucleotide probe composition comprises about 3 to 50 oligonucleotides i.e. each oligonucleotide probe spot (microarray) has a size of 1mm<sup>2</sup> (Column 11, line 62-67) and a probe density of 100 per cm<sup>2</sup> (Column 6, lines 32-33).

Regarding Claim 13, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein all of the oligonucleotide spots hybridize to the same type of target nucleic acid i.e. cDNA (Column 4, lines 60-64).

Regarding Claim 14, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein the density of spots (microarray) on said array does not exceed about 1000/cm<sup>2</sup> (Column 11, lines 62-67).

Regarding Claim 15, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein the density of spots (microarray) on said array does not exceed about 400/cm<sup>2</sup> (Column 11, 62-67).

Regarding Claim 16, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein the number of spots (microarray) on said array ranges from about 50 to 10,000 i.e. 96 (Column 11, 62-67).

Regarding Claim 17, Brown et al. disclose the array (multi-cell substrate) of Claim 1 wherein the number of spots (microarray) on said array ranges from about 50 to 1,000 i.e. 96 (Column 11, 62-67).

Regarding Claim 57, Brown et al. teaches an array which is a multi-cell substrate, comprising a pattern of probe oligonucleotide spots which are microarrays, that are attached to a surface of a solid support (Column 11, lines 51-61) wherein each probe oligonucleotide spot (microarray) comprises an oligonucleotide probe composition made up of 3 to 50 unique

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oligonucleotides (Column 6, lines 32-33 and Column 11, line 62-67) of from about 15 to 150 nucleotides in length (Column 13, lines 21-22) and wherein each unique oligonucleotide hybridizes to a different region of the target nucleic acid (Example 3, Column 18, lines 40-43).

Regarding Claim 58, Brown et al. teaches an array which is a multi-cell substrate, comprising a pattern of probe oligonucleotide spots which are microarrays, that have a density that does not exceed about 400 spots (microarray)/cm<sup>2</sup> attached to a surface of a solid support (Column 11, lines 62-67) wherein each probe oligonucleotide spot (microarray) corresponds to a different target nucleic acid (Example 3, Column 18, lines 40-43) and comprises an oligonucleotide composition made up of 3 o 20 unique oligonucleotides (Column 6, lines 32-33 and Column 11, line 62-67) of from about 25 to 100 nucleotides in length (Column 13, lines 21-22) wherein each unique oligonucleotide hybridizes to a different region of the target nucleic acid (Example 3, Column 18, lines 40-43).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al. (U.S. Patent No. 5,807,522, filed 7 June 1995) as applied to claim 1 above, and further in view of Fodor et al. (U.S. Patent No. 5,800,992, filed 25 June 1996).

Regarding Claim 3, Brown et al. disclose the array (multi-cell substrate) of Claim 1 comprising at least one pattern of probe oligonucleotide spots (microarray) attached to a surface of a solid support wherein each oligonucleotide spot (microarray) comprises a plurality



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of unique oligonucleotides for a target nucleic acid. Additionally, Brown et al. teach the unique oligonucleotides are positioned at known addressable regions (Column 11, lines 55-58) and hybridize to all known mutations in a disease gene (Column 15, lines 19-22). Brown et al. do not teach said plurality of unique oligonucleotides hybridize to non-overlapping regions of said target nucleic acid. However, Fodor et al. teach a similar microarray comprising a pattern of unique oligonucleotide probes attached to a surface of a solid support wherein the probes are attached to the support in a matrix of positionally defined regions (Column 2, lines 34-40) and wherein the oligonucleotide probes for fingerprinting hybridize with "absolute complementary matching" to the target sequence (Column 9, lines 60-67).

Regarding Claim 4, Brown et al. do not teach said plurality of unique oligonucleotides hybridize to overlapping regions of said target nucleic acid. However, Fodor et al. teach a similar microarray wherein the oligonucleotide probes for mapping hybridize to overlapping regions of a target nucleic acid (Column 10, lines 1-12). It would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the array of Brown et al. with the teaching of Fodor et al. to obtain the claimed invention because one of skill in the art would have been motivated with a reasonable expectation of success to modify the oligonucleotide probes of Brown et al. with the oligonucleotide probes of Fodor et al. wherein both sets of probes are used in hybridization assays, based on the oligonucleotide probes' equivalent chemical and physical properties and the oligonucleotide probes' equivalent positioning on the substrate and based on experimental design wherein overlapping probes are used for mapping and non-overlapping probes are used for fingerprinting for the expected benefit of rapid and convenient screening, eliminating the need to handle and detect individual arrays as taught by Brown et al. (Column 15, lines 59-64).

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8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al. (U.S. Patent No. 5,807,522, filed 7 June 1995) as applied to Claim 1 and further in view of Lockhart et al. (U.S. Patent No. 6,040,138, filed 15 September 1995).

Regarding Claim 11, Brown et al. do not teach the array (multi-cell substrate) of Claim 1 wherein the array further comprises at least one mismatch probe. However, Lockhart et al. teach a similar microarray comprising a pattern of unique oligonucleotide probes attached to a surface of a solid support wherein the probes are attached to the support in a matrix of positionally defined regions (Column 2, lines 60-65) and wherein the microarray comprises at least one mismatch probe (Column 3, line 30). It would have been prima facie obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the array of Brown et al. with the teaching of Lockhart et al. to obtain the claimed invention because one skilled in the art would have been motivated with a reasonable expectation of success modify the Brown et al. microarray of probes and to include mismatch control probes as taught by Lockhart et al. wherein hybridization signal intensity is compared to mismatch hybridization for the expected benefit of accurately quantifying hybridization as taught by Lockhart et al. (Column 3, lines 30-38).

9. Claims 53 & 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al. (U.S. Patent No. 5,807,522, filed 7 June 1995) as applied to claim 1 above, and further in view of Stratagene catalog (1989, page 39).

Regarding Claim 53, Brown et al. teach the array of Claim 1 comprising at least one pattern of probe oligonucleotide spots which are microarrays are attached to a surface of a solid support wherein each oligonucleotide spot (microarray) comprises a plurality of unique oligonucleotides for a target nucleic acid. Additionally, they teach hybridization assay and assay reagents wherein the assay is performed on said array (Example 3, Column 18, lines 34-

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63). Brown et al. do not teach the combined into a kit. Stratagene catalog teaches a motivation to combine reagents into kit format (page 39).

Regarding Claim 59, Brown et al. teach the hybridization assay further comprising reagents for generating a labeled target nucleic acid sample (Column 16, lines 39-54). Brown et al. do not teach the combined into a kit. Stratagene catalog teaches a motivation to combine reagents into kit format (page 39).

It would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine the method of Brown et al. into a kit format as discussed by Stratagene catalog since the Stratagene catalog teaches a motivation for combining reagents of use in an assay into a kit, "Each kit provides two services: 1) a variety of different reagents have been assembled and pre-mixed specifically for a defined set of experiments. 2) The other service provided in a kit is quality control" (page 39, column 1).

### **Conclusion**

10. No claim is allowed.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:45 TO 4:15.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8742 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

BJ Forman, Ph.D.  
June 15, 2000

*S. Zitomer*  
S. Zitomer  
Patent Examiner